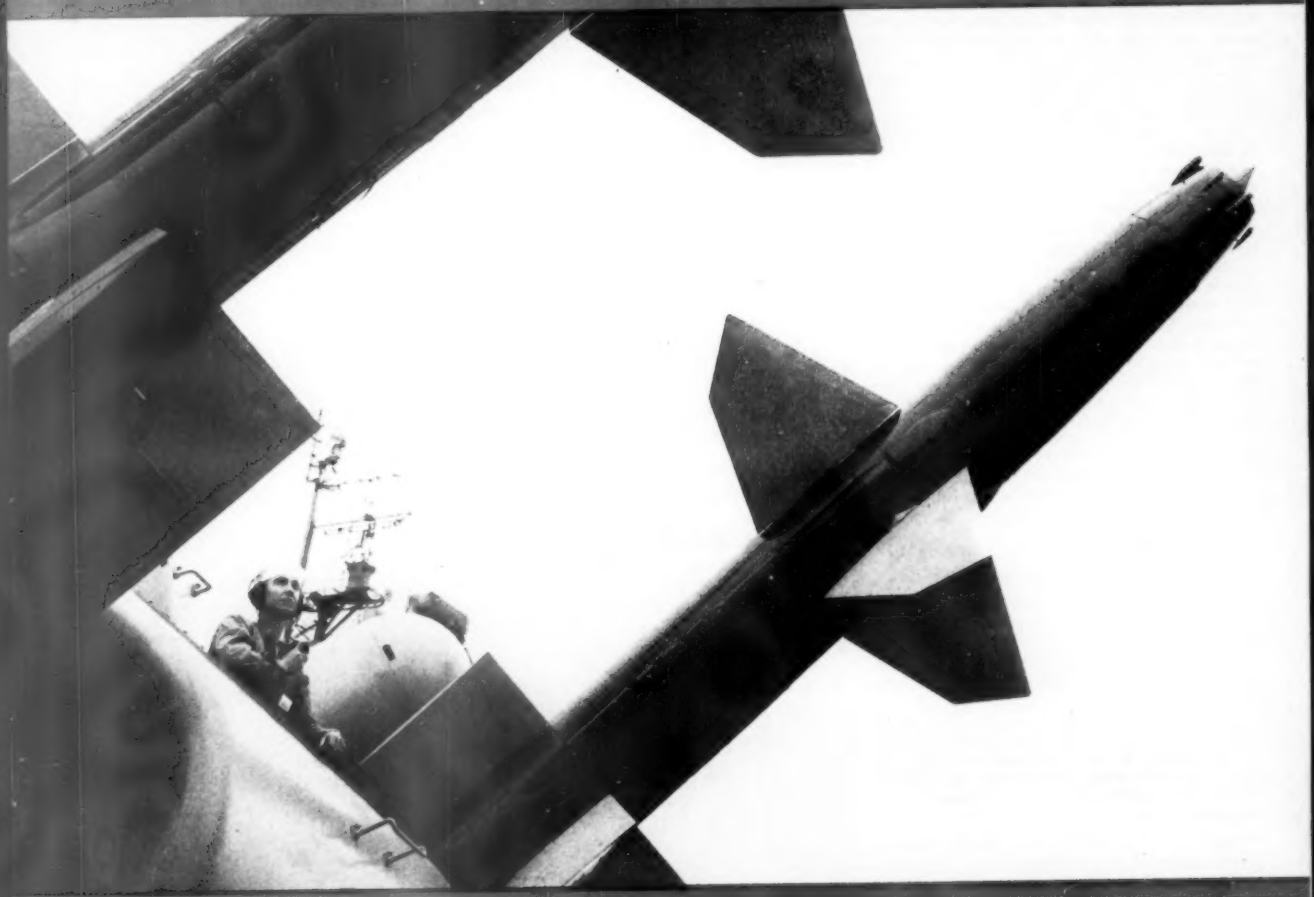
15¢
$5.50 A YEAR

June 7, 1958

VOL. 73 NO. 23 PAGES 353-368

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Airpower by Sea

See Page 357

A SCIENCE SERVICE PUBLICATION

The fullest, most comprehensive non-technical history of mathematics ever written in English, this 1355-page work ranges from prehistoric times to the beginning of the 20th century. It covers the mathematical thought and contributions of the entire world, from the Ancient Egyptians and Sumerians up through Greece and Rome, the Islamic and European Middle Ages, the Orient, and Modern Europe and America. All aspects of mathematics from number systems up through calculus are traced from their origins.

"Marks an epoch . . . it will modify the entire teaching of the history of science," George Sarton.

The first volume of Smith's HISTORY OF MATHEMATICS undertakes a clear, full survey of the development of numbers, arithmetic, counting systems, geometry, algebra, trigonometry, business mathematics, calculus, and special topics in higher mathematics. All in all Professor Smith, in his survey, considers more than 1100 mathematicians in all times and areas, giving their biographies in brief, expositions of their contributions, and their most significant works. To list only a few of the topics and persons discussed in full, clear detail: counting systems other than decimal, the Ahmes Papyrus, applied math. in the Pyramids, Pythagoras, ancient Chinese mathematics, Antiphon, Manaeachmus, Aristarchus, Eratosthenes, Archimedes, Heron, Diophantus, Brahmagupta, cubic equations, oriental approximations of pi, Ya'qub ibn Tariq, al Astorlabi, Al-Kindi, Cassiodorus, Psellus, rithmomachia, Roger Bacon, Fibonacci, Sacrobosco, Villa Nova, Oresme, Cusa, Mongol algebra and astronomy, Avicenna, Cardan, Tartaglia, Ramus, Stifel, Copernicus, Glareanus, Galileo, Cassini, Descartes, Fermat, Napier, Barrow Newton, Kepler, Leibniz, Huyghens, Imamura, Cotes, Cocker, Boole, Cayley, Clifford, Lagrange, Laplace, Legendre, Carnot, Cauchy, Galois, Poincare, Gauss, Moebius, Cantor, Dirichlet, Weierstrass, Dedekind, Euler, Abel, Lie, Bolyai, Peirce, Gibbs, and more than one thousand other mathematicians.

The second volume is unique in scientific histories. It is a topical history showing the growth in all times and places of ideas, theories, methods of notation, and similar matters. It covers natural numbers, reading and writing numbers all over the world, mechanical aids to calculation, artificial numbers, geometry, approximations of pi, non-Euclidean geometry algebra, logarithms, infinite series, mechanical recreations, trigonometry, measures, calculus, and similar topics. In each case you will learn how a particular branch of mathematics arose and was developed. You will see, for example, how the idea of decimals was first understood by Jean de Meurs in 14th century France, and Ulugh Beg in 15th century Persia; how they were partly applied by Cardan in 16th century Italy, and first fully developed by Rudolff in 16th century Germany.

"A significant and unique addition to the literature," SCIENCE PROGRESS.

An unusual feature in Smith's HISTORY OF MATHEMATICS is its copious and original illustration, with more than 500 drawings and photographs of famous mathematicians, symbols, mathematical instruments, and monuments. An enormous bibliography and critical apparatus is contained in more than 2,100 footnotes.

The life-time work of the late Professor Smith, this gigantic history is entirely written so that it can be read and followed by the reader who has never gone beyond elementary trigonometry. It is still of great interest and value to the professional mathematician, physicist, and other reader interested in higher mathematics. It will

- Prepare you for more technical histories of special topics, areas, or mathematicians . . .
- Provide you with a historical framework for understanding ideas . . . most readers find it easier to assimilate abstract ideas if the ideas are expressed in a context of personality, time, and place . . .
- Give you a first-rate understanding of the streams of thought which culminate in modern mathematics . . .
- Delight you for hours with fascinating lore and interesting facts . . . make you see the color and interest within this important branch of knowledge . . .

Teachers use Smith's HISTORY OF MATHEMATICS as an inexhaustible mine of study suggestions and expositions; students find it unexcelled as supplementary reading. Mathematicians, historians find it one of the best research aids ever written.

HISTORY OF MATHEMATICS by D. E. Smith. Two volumes, total of 510 illustrations. Total of 1355 pages. 5⅜ x 8. Two volume set, boxed in attractive container, paperbound.

The set, $5.00

Did you know that . . . .

* *The word "algebra" in 16th century England also meant bone-setting, and barbershops often displayed signs reading "Algebra and blood-letting" . . .*

* *Mechain, a French mathematician, made an error of 3″ in the latitude of Barcelona; to cover himself, he proposed shifting the meridians all over the world . . .*

* *Mathematical notation developed late . . . Cardan, in the 16th century, for example, had to write the expression $x^2 + 4x + 4$ as ce'p:4reb.'p:4 . . .*

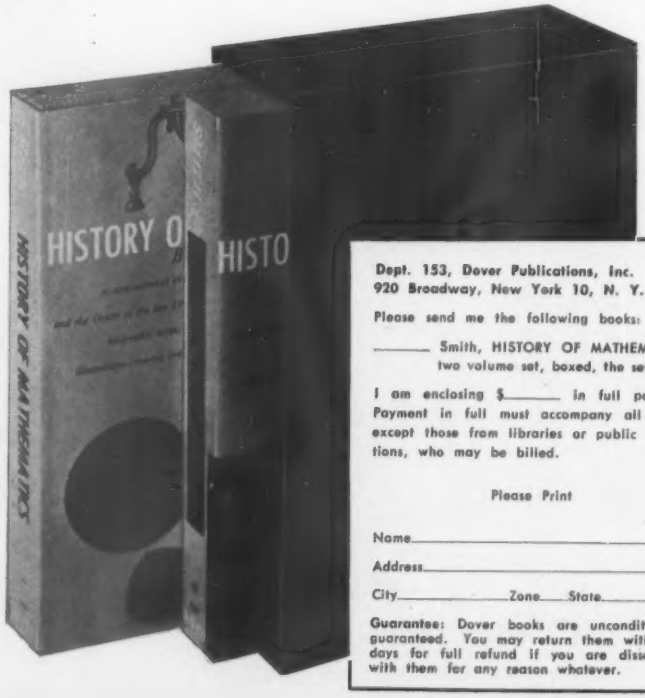
* *Newton was so absent-minded that one day, when he was leading his horse, the horse slipped away, and Newton dragged the empty bridle behind him for hours before someone told him the horse was missing . . .*

thousands of other interesting and important facts in

Smith's HISTORY OF MATHEMATICS

the most comprehensive non-technical history of mathematics in English . . .

formerly $13.00 — now only $5.00 per set



Dept. 153, Dover Publications, Inc.
920 Broadway, New York 10, N. Y.

Please send me the following books:

_____ Smith, HISTORY OF MATHEMATICS, two volume set, boxed, the set $5.00

I am enclosing $_____ in full payment. Payment in full must accompany all orders except those from libraries or public institutions, who may be billed.

Please Print

Name_____

Address_____

City_____ Zone____ State_____

Guarantee: Dover books are unconditionally guaranteed. You may return them within 10 days for full refund if you are dissatisfied with them for any reason whatever.

ELECTRONICS

Machine Solves Problems

Electronic machines, the so-called "brains," now being used to bring added speed and accuracy to many processes, are contributing to learning and problem solving.

➤ HOW TO make it easier for machines and human beings to talk to one another was discussed at a conference in San Jose, Calif., on the communication of scientific information.

Machines that can handle non-numerical information have become very important.

Non-numerical problems include recognition of human speech by machine and mechanical translation of language. Machines for such problems must be able to handle information in the same form that human beings use.

Related problems are retrieving information from documents in library storage and the design of self-organizing machines that can be taught to play chess or to prove mathematical theorems.

These latter machines are important because they are able to simulate some important characteristics of human problem solving.

Although special small machines and adaptations of large numerical computing machines have been used for years in non-numerical problems, workers in the field have shown that non-numerical problems do not readily fit on the standard computing machines built for adding and multiplying numbers. (See p. 360.)

Non-numerical problems require machines that may be more complex than ordinary computing machines. To build such machines for non-numerical problems requires better understanding of the principles of human communications.

For example, although a trained mathematician can set down the step-by-step procedures necessary for solving mathematical problems, no trained linguist has yet been able to tell a machine exactly how to set about producing a really good translation from one language to another.

The two-day conference was held in conjunction with the dedication of the new manufacturing and research facilities of the International Business Machines Corporation.

The IBM facilities include a manufacturing plant for the IBM 305 RAMAC, a machine designed for business data processing but which can be adapted to non-numerical usage because of its large memory capacity for 5,000,000 alphabetical or numerical characters.

"Electronic Librarian"

➤ AN "ELECTRONIC librarian" was described by Dr. H. P. Luhn of the International Business Machines Corporation.

The business intelligence system, reported to the conference of communication scientists, would be able to match documents to readers.

Dr. Luhn envisions a centralized service using a large-scale computing machine that would combine information retrieval with a notification service to the users of the information.

In Dr. Luhn's system the potential user would first write a description of his background and work. This would be analyzed by machine to determine a "profile" of the subjects in which the user would be interested.

At the same time, documents fed into the machine would also be analyzed and standard abstracts prepared.

The information analysis of each document would then be matched by the machine with the interest "profile" of each user, Dr. Luhn said.

The user would be given a selected list of titles by the machine, if the machine's matching showed that the user should receive the new information. From these titles the user could then select abstracts and from the abstracts, full papers that he would want to read.

In the final step, the machine would note which documents the user selected and the machine would revise the user's "profile" immediately. In this way the machine would always have an up-to-date picture of interests of each of its users.

Direct requests for information made by the user could also be reflected in his "profile."

Communication Aid

➤ NEW MATHEMATICAL tools are being created to help us understand the systems that generate and process information, whether they are human beings or computing machines.

This is the opinion of Dr. Jerome B. Wiesner, director of the Research Laboratory of Electronics, Massachusetts Institute of Technology, and member of the steering committee of MIT's newly formed Center for Communication Sciences, speaking at the dedication ceremonies.

Dr. Wiesner told how these new tools, now emerging from many branches of mathematics, are essential to the understanding we have of electrical communication, language, computing devices, servomechanisms, and many other of the communication sciences. He looked forward to further developments that will give a better understanding of the complicated problems of communication and control found in living creatures.

The results, he said, could make important contributions to mental health and social relations. In addition, Dr. Wiesner stated, a better understanding of the underlying theory should permit man-made information processing devices, such as computing machines, to be made more versatile, intelligent, and useful.

He stressed that it is possible to know a great deal about the performance of communication without having the generalizations that will account for the details observed. Although we have had electrical communication systems for more than a hundred years, Dr. Wiesner pointed out, the mathematical theory of communication is only about 15 years old.

He cited the work of Prof. Claude E. Shannon of MIT, also a speaker at the dedication meeting, and of Prof. Norbert Wiener of MIT.

SEA COPTER—The new Sikorsky S-62 is believed to be the first amphibious helicopter ever built with a flying boat-type hull, suitable for operating from water, land, ice, snow or swamp. The hull weighs less than a land type hull equipped with inflated pontoons for water landings. Much of the drag associated with pontoon-type flotation, in flight and in the water, is also eliminated.

AERONAUTICS

Prepare Air Safety Plan

A five-part, multi-million dollar program has been drawn up by the Weather Bureau in an attempt to modernize its aviation weather services.

➤ THE WEATHER Bureau is preparing to make air travel in the now imminent jet age as safe as possible weatherwise.

Detailed plans for a long-range modernization of its aviation weather services have been drawn up and will be presented to Congress, probably next year. In light of two recent mid-air crashes, some weathermen and Congressional leaders are expected to urge approval of the plans before that time.

The multi-million dollar program is designed to mesh with the modern air traffic control and airways system now being developed by the Civil Aeronautics Administration. It will bring a gradual but nevertheless revolutionary change to weather services not only for aviation but also to the general public through its greatly expanded weather reporting network.

The plan is flexible enough to adapt to changing requirements over a period of years, and will also provide the basic meteorological data required for national defense.

Five parts, each representing fields of specialized operation but all intimately related, make up the weather system planned for completion by mid-1962. They are observing and forecasting weather in the immediate vicinity of the airport and on runways, observing and forecasting weather en route, and the wholesale dissemination of weather information.

Serving in direct support of these five parts, and fundamental to their operation, are improvement of the present aviation weather network and considerably more emphasis on meteorological research and development.

The plan for modernization of surface weather observing in airport approach zones calls for installing automatically operated cloud height and runway visibility measuring equipment at all airports having instrument landing systems.

Complementing this program, all observing stations are scheduled to have completely automatic equipment that will record weather elements, automatically transmit the information on special weather circuits and record the data in punched card form.

Science News Letter, June 7, 1958

ELECTRONICS

Moon Aids Phone Calls

➤ THE MOON may be used as a reflector for intercontinental telephone calls within a few years.

This peacetime applicaton was seen as one outcome of a still-secret Air Force study made by University of Michigan scientists.

They found very shortwave radar or radio signals can be used to bounce voice transmissions off the moon, without appreciable loss in quality, to a receiver halfway round the world.

This means the curvature of the earth need no longer limit communications distances if both transmitting and receiving equipment can "see" the moon. (A radar signal travels in a straight line.)

The research was conducted under contract to the Air Force's Rome Air Development Center by Prof. Keeve M. Siegel and Thomas B. A. Senior, research associates at the University of Michigan's Engineering Research Institute.

Voice communications, at long wavelengths, using the moon as a reflector, were shown feasible several years ago. The Michigan investigators found very short wavelengths of about one inch give such improvement in clarity it is now commercially feasible to set up a world-wide network of stations using the moon as a reflector.

Careful analysis and measurement of radar signals reflected from the moon also yield additional information on the composition of the moon's surface, which should help fill gaps in lunar knowledge.

Success in developing the reflection theory resulted when the scientists, checking reports by other researchers throughout the nation, found certain incorrect conclusions had been drawn. One of these was the assumption that, because of the jagged mountains and craters known to exist on the moon, the moon would appear rough to a radar signal. A shortwave signal is reflected from an area of only a few square feet.

The moon has such areas that are smooth so the radar signals are reflected without a loss in quality.

Science News Letter, June 7, 1958

NUMISMATICS

Inflation a Problem In Early Christian Era

➤ INFLATION was already a problem in the early Christian era and the Roman rulers of that time tried to meet the problem of rising prices by manipulating the currency.

This is reported by Dr. Earle R. Caley, professor of chemistry at Ohio State University, in the *Centennial Volume*, published by the American Numismatic Society, New York.

After studying the tetradrachm, standard silver coin of Egypt, Dr. Caley found that the coins were debased during the first three centuries A.D. by reducing the silver content and replacing it with other metals, principally copper.

The tetradrachms, although they carry Greek inscriptions, were struck off at Alexander, Egypt, which was then Roman.

From the days of the Roman Emperor Tiberius, 14 to 37 A.D., to the reign of Diocletian from 294 to 305, the silver content of the tetradrachm declined from an average of nearly 44% to one-half of one percent. Some of the coins of Diocletian had no silver at all.

Science News Letter, June 7, 1958

SCIENCE NEWS LETTER
VOL. 73 JUNE 7, 1958 NO. 23

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N.W., Washington 6, D. C., NOrth 7-2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., $5.50; 2 yrs., $10.00; 3 yrs., $14.50; ten or more copies in one package to one address, 7½ cents per copy per week; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

Copyright © 1958 by Science Service, Inc. Republication of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicated services issued by Science Service. Science Service also publishes CHEMISTRY (nine times a year) and THINGS of Science (monthly).

Printed in U.S.A. Entered as second class matter at the post office at Washington, D. C., under the act of March 3, 1897. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40 P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283) authorized February 28, 1950. Established in mimeograph form March 13, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Reader's Guide to Periodical Literature, Abridged Guide, and the Engineering Index. Member Audit Bureau of Circulation.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: William W. Rubey, U. S. Geological Survey; Wallace R. Brode, National Bureau of Standards; Douglas Whitaker, Rockefeller Institute for Medical Research. Nominated by the National Academy of Sciences: Edward U. Condon, Washington University; Harlow Shapley, Harvard College Observatory; Philip Bard, Johns Hopkins University. Nominated by the National Research Council: I. I. Rabi, Columbia University; Leonard Carmichael, Smithsonian Institution; John R. Dunning, Columbia University. Nominated by the Journalistic Profession: O. W. Riegel, Washington and Lee University; Michael A. Gorman, Flint Journal; Lee Hills, Detroit Free Press. Nominated by the Scripps Estate: Edward J. Meeman, Memphis Press-Scimitar; Frank Ford, Washington, D. C.; Charles E. Scripps, Cincinnati, Ohio.

Officers — President: Leonard Carmichael; Vice President and Chairman of Executive Committee: Charles E. Scripps; Treasurer: Wallace R. Brode; Secretary: Watson Davis.

Staff — Director: Watson Davis. News Editor: Howard Simons. Writers: Marjorie Van de Water, Ann Ewing, Jane Marye, David Pursglove, Benita Tall. Science Youth Division: Harold A. Edgerton, Joseph H. Kraus, Margaret E. Patterson. Photography: Fremont Davis. Production: Priscilla Howe, Marcia Nelson. Syndicate Sales: Hallie Jenkins. Interlingua Division in New York: Alexander Gode, 80 E. 11th St., GRamercy 3-5410. Advertising Manager: Fred A. Moulton, MEtropolitan 8-2562.

ENDOCRINOLOGY

Find Pineal Hormone

Melatonin, the first hormone isolated from the pineal gland, is expected to provide scientists with some answers to the mysteries surrounding this gland.

➤ THE FIRST hormone ever isolated from the mysterious pineal gland has been discovered.

The hormone has been named Melatonin. The function of the new hormone has not been determined either in humans or in animals, according to five scientists at the Yale School of Medicine.

However, tests in frogs show Melatonin lightens the skin shade and reverses the darkening effect of other hormones. The Yale investigators are working on experiments to see if the hormone has any connection with the skin cancer known as melanoma.

More than 250,000 beef pineal glands were required to isolate the hormone because the gland produces a very minute amount of the hormone, the scientists say. This limited quantity of Melatonin, at present, delays many of the experiments for testing it. Melatonin belongs to the chemical family known as hydroxyindoles.

Tests to determine if Melatonin was present in other beef glands and organs were all negative, Drs. Aaron B. Lerner, James D. Case, Yoshiyata Takahashi, Teh H. Lee and Wataru Mori, all of the Yale section of dermatology, say. Their report appears in the *Journal of the American Chemical Society* (May 20).

Dr. Lerner first decided to work on the pineal gland several years ago when he was conducting research on factors that lighten and darken skin, particularly frog skin used in laboratory experiments. Melanocyte stimulating hormone (MSH) from the pituitary gland is the most potent skin darkener, while adrenalin and serotonin lighten the skin.

Pineal gland extract had been known to exhibit skin lightening properties, but the exact hormone had never been isolated.

The pineal gland is located deep in the brain of human beings. It is a small, conical-shaped gland about one-half inch in length. The gland has long puzzled medical scientists who still have not discovered its function or purpose in the body.

Science News Letter, June 7, 1958

SURGERY

Parathyroids Transplanted

Surgeons have met with success in a rare operation, the transplantation of parathyroid glands from one human to another. Two patients gained partially functioning glands.

➤ THE LIMITED success of transplantation of thyroid and parathyroid glands from one human to another has been reported by two surgeons.

Two adult patients now have partially functioning parathyroid glands.

The first transplant occurred 16 months ago. The second occurred six months ago. Thyroid glands, taken from dead infants, transplanted in both patients have shown no evidence of functioning.

The first patient, a 28-year-old male, whose thyroid and parathyroid were removed when they became cancerous, received the glands of a stillborn infant. Before surgery it had been necessary for him to take 24 grams of oral calcium, 100,000 units of vitamin D and another anti-tetany drug daily.

These drugs were necessary to control tetany, a condition due to decreased parathyroid function, in which cramps, convulsions and muscular twitching occur.

When his condition stabilized following surgery, the calcium dosage was reduced to one to four grams daily, while all other drugs were eliminated. No further symptoms have occurred, Drs. George L. Jordan Jr., chief of the surgical service, and Riley P. Foster, both of the Veterans Administration Hospital in Houston, told the American Association of Plastic Surgeons meeting in Dallas.

The other patient, a 53-year-old woman, received thyroid and parathyroid glands from an infant who had died of congenital heart disease. Following surgery, her calcium dosage was cut by two-thirds, other medication was eliminated.

In addition to showing no tetany symptoms, the doctors reported, this patient has reported a considerable return of energy following the transplant operation. The length of time survival will continue cannot be predicted, the surgeons said.

Surgical transplant of parathyroid or thyroid is rare. The first transplant was made in 1952 at the Albert Einstein Medical Center in Philadelphia.

Dr. Jordan transplanted parathyroid glands from a stillborn infant to a 36-year-old veteran one year ago. He is reported to be in good health.

Science News Letter, June 7, 1958

● RADIO

Saturday, June 14, 1958, 1:30-1:45 p.m., EDT.

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio network. Check your local CBS station.

Dr. Hugh L. Dryden, director of the National Advisory Committee for Aeronautics, Washington, D. C., will discuss "Space Research."

ROCKETS AND MISSILES

Commission First Navy Talos Missile Cruiser

See Front Cover

➤ THE FIRST U. S. Navy ship armed with the Talos "muscle missile" has been commissioned.

The U.S.S. Galveston, the second Navy ship named after the Texas city, was formally put into service by Rear Adm. E. R. McLean, commandant of the Fourth Naval District. The command was accepted by Capt. John B. Colwell, skipper of the new vessel.

Designed primarily as a "fleet protection instrument," the Galveston is the only U. S. ship of any kind equipped with the supersonic ship-to-air missile, Talos. Developed by Bendix Aviation Corp., the Talos is capable of delivering an atomic warhead anywhere within a radius of 65 miles.

The Galveston's mission in event of war would be not only to destroy attacking enemy aircraft but also to bombard enemy ships and coastal installations.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows a pair of the Talos missiles. Gunner's Mate 1/C Donald Welch, of Seymour, Tex., makes a final check from the turret hatchway of the Galveston.

The Talos is powered by a ram-jet engine of 40,000 horsepower, giving it a supersonic speed faster than a bullet and a range far in excess of Navy big guns. As auxiliary equipment, the Galveston will mount five- and six-inch guns.

Although fired from only one launcher on the Galveston's after-deck, the Talos missiles can be loaded quickly enough that the second is fired before the first hits its target. Navy officials refused to comment on the number of warheads carried by the Galveston, but hinted that an enemy could not deploy a task force capable of taxing the Galveston's destructive capacity.

If the six-inch guns have to be manned after all the missiles are used, a Navy officer said, the ship is as good as dead.

The actual range of the missile on contact is not now known but will be determined after extensive shake-down cruise tests before the Galveston joins the Sixth Fleet in the Mediterranean later in the year. Since the Talos missile is designed to carry an atomic warhead, its effective range is indeterminate, but of "atomic proportions," the Navy said. That is, even if an enemy sends a large formation of aircraft and spreads them out, the missile can still hit them because of the size of the blast.

Science News Letter, June 7, 1958

TECHNOLOGY

Troops Travel by Rocket

Infantry troops may soon be traveling by a revolutionary new vehicle: individual, small rockets, powered by solid propellants that can shoot them across rivers and obstacles.

➤ INFANTRY troops can be "shot" across rivers by small rockets attached to their backs, Army Engineers have revealed.

A modification of the revolutionary rocket development may also carry light jeeps and heavy tanks across most rivers without need for boats or bridges.

The personal rockets, dubbed "Buck Rogers" because they look and act like the device used by the comic strip character, also are expected to be useful in combat away from rivers by turning troops into "human grasshoppers," able to cover 100-yard distances "almost quick as a flash," Army officers told SCIENCE SERVICE.

Troops carrying the small rocket engines on their backs approach a battle area cautiously, then, at the push of a button, cover the final 80 to 100 yards with a tremendous burst of speed through the air, and "come up fighting," the officers explained.

"This development will give the foot soldier the greatest element of surprise and maybe the greatest tactical advantage ever introduced into warfare," an officer said.

"It will be just like making every foot soldier a jet-propelled grasshopper," he said.

Another officer compared the new device with a "human cannonball" shot from a cannon at a circus.

"It would be just like having thousands of man-firing cannons at the front lines, without the problems involved in transporting and positioning the cannons," he said.

"The new device actually is not as unbelievable as it sounds at first," a highly placed official stated, "when it is remembered that already we have under development personal helicopters that can be fastened to a soldier with a harness."

He implied the rocket device would be more efficient, much faster and considerably cheaper than the back-strapped helicopters.

The "Buck Rogers" will use a solid propellant rocket thrust to transport men "almost instantaneously" over distances up to 100 yards at a maximum altitude of 20 feet.

Under most combat conditions the "hops" will cover 50 to 80 yards at an altitude of "less than 16 feet," high enough for the troops to clear most obstacles, but not high enough to cause injuries upon landing.

Although engineers are confident the device will prove itself to be safe, they expect that troops using it will have to undergo special training similar to paratrooper conditioning.

"There probably will be quite a shock upon impact, and these men will have to be taught to come up fighting," an officer said.

Army tacticians view the potential surprise element offered by the devices as an outstanding advantage, but even greater in importance, they say, is that the small rockets will carry infantry troops across many of the earth's waterways.

An immediate modification, officers said, is that more powerful rockets can be attached to vehicles with closed bottoms, such as tanks or jeeps with steel "surf boards" bolted underneath.

The vehicle would enter the water at the highest practical speed. As soon as the driver felt a loss of speed the rockets would be fired and the vehicle would "skim" the remainder of the way across the water.

Science News Letter, June 7, 1958

STRATOSPHERE CHAMBER—Tests simulating conditions ranging from sea level to 100,000 feet can be carried out in this stratosphere chamber of the Royal Radar Establishment at Malvern, Worcestershire, England. A radar scanner is being tested.

PUBLIC HEALTH

Home Accidents Take High Six-Month Toll

➤ HOME ACCIDENTS injured 10,065,000 people, 40.3% of all those injured during the last six months of 1957, a report issued by the U. S. Department of Health, Education, and Welfare states.

The report includes only those accidents which injured Americans enough to require medical attention or to limit their activities for at least a day. The report reveals that of the 25,000,000 citizens injured during the six-month period, the home was the location of the highest percentage of accidents.

Approximately 17%, or 4,173,000 persons, were injured at work. Motor vehicle accidents injured 9.8%, or 2,444,000 persons. Other kinds of accidents and injuries resulting from violence accounted for 33.1% or 8,267,000 injuries.

Science News Letter, June 7, 1958

ENGINEERING

Midget Wind Tunnel Built For Wide Range Testing

➤ A MIDGET wind tunnel, costing less than $50,000, has been built in less than four months.

The new facility, Dr. Milton U. Clauser, vice-president and director of Space Technology Laboratories, a division of the Ramo-Wooldridge Corporation, reported, is housed in three sections. These are: a 16-by-32 foot building containing the tunnel test section and instruments, a 7-foot diameter vacuum tank only 16 feet long, and a 9 foot diameter storage tank 25 feet high.

In operation, air is pumped into a 500-cubic-foot rubber bag in the storage tank, and released through the tunnel into the vacuum tank. The test period is automatically terminated after ten seconds.

The new device was built for the Air Force Ballistic Missile Division of the Air Research and Development Command, and will be used to determine airflow in magnetic fields, Dr. Clauser said. Tests can be conducted at up to three times the speed of sound.

Science News Letter, June 7, 1958

MEDICINE

Internal Photos Taken

Two devices, designed to be used with a gastroscope, should make possible improved diagnoses and treatment of the stomach, giving a tool for photographing the organ.

➤ A SAFE method of taking colored pictures and slides of the inside of the human stomach has been achieved. Two devices have been designed for this purpose.

One is an electronic flash attached to the exploratory end of a gastroscope, directly beneath the opening through which the stomach is viewed.

A prism reflects the image through a series of lenses encased in the tube. A 35 millimeter camera is attached to the viewing end of the gastroscope. The doctor can view the diseased area of the stomach, focus the image with the camera and snap the shutter button that is synchronized with the flash.

The inventors, Prof. Ch. Debray and Pierre Housset, Faculty of Medicine of Paris, France, demonstrated the already well-tested instrument at the 17th annual meeting in Washington, D. C., of the American Gastroscopic Society and the World Congress of Gastroenterology.

Another instrument, a gastroscope with a built-in light bulb, was introduced by Dr. Robert S. Nelson, University of Texas, M.D. Anderson Hospital, Texas Medical Center, Houston.

The bulb, like the flash, is encased in the tube beneath the viewing window at the exploratory end of a gastroscope. However, the bulb is constantly glowing and when used for color photography, the brightness of the light is increased by additional power from the same battery source. These batteries are separate from the gastroscope.

When the doctor inserts the gastroscope down the throat and into the stomach, he first locates the diseased area of the stomach. The image is reflected, the same as in the flash unit, against a prism and through a series of enclosed lenses. Any 35 millimeter camera can be used.

These new devices will enable doctors to document and record the progress of lesions of the stomach over a period of years, Dr. Nelson pointed out.

Science News Letter, June 7, 1958

MEDICINE

Capsule Method Makes Digestive Exam Easier

➤ A NEW METHOD of performing the difficult digestive tract examination has been announced.

A small plastic capsule is swallowed that can be opened at the discretion of the examining physician. Then it travels the length of the digestive tract. It is recovered after being excreted, usually 24 hours after swallowing.

The capsule method, called Pyxigraphy, was developed by Dr. Jean-Pierre Perrenoud, General Medicine, Neuchatel, Switzerland.

The capsules are carried through the digestive tract along with food. X-rays tell the physician where the capsule is located at all times. At a given time, the physician is able to open the capsule, thereby sampling the liquid present at any stage of the digestive process.

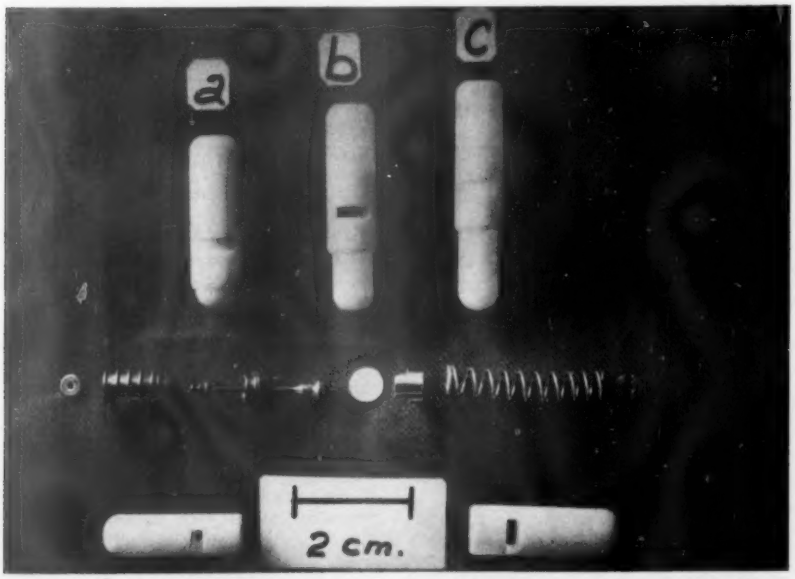
With the capsule, it is possible to sample the acid content of the stomach, or detect intestinal infections, Dr. Perrenoud said.

The device which controls opening or closing of the capsule is a small magnetic metal block placed inside the capsule, heated by a high frequency field.

The capsule itself is 25 millimeters long, eight millimeters in diameter. The cylinder is rounded at both ends.

Advantages of this capsule over the standard American method include the ability to take actual samples of the liquid in the stomach, and the capsule's small size and comfortable acceptance by the patient, the inventor reports in *Gastroenterologia* (Vol. 87, No. 6).

Science News Letter, June 7, 1958



PYXIGRAPHY CAPSULE—Capsules in various stages of being opened are shown in the photograph along with the small magnetic block that controls the capsule's opening or closing inside the digestive tract.

PUBLIC HEALTH

Arsenic Revealed in Two British Detergents

➤ A BASIC research experiment in Glasgow, Scotland, resulted in the unexpected finding that two popular British household detergents contained large amounts of arsenic.

The manufacturer of the two detergents modified the responsible processing stage after notification of the surprise findings.

The discovery was made after scientists found abnormally high arsenic concentrations in the hair of female laboratory assistants. Hair samples submitted by male colleagues showed only "normal" arsenic concentrations, about one part per million.

Drs. J. M. A. Lenihan, Western Regional Hospital Board, Hamilton Smith, University of Glasgow, and J. G. Chalmers, Royal Beatson Memorial Hospital, all of Glasgow, had requested the hair samples for basic research experiments in their study of the tiny amounts of arsenic normally present in nearly all hair.

A preliminary analysis showed arsenic present in the female hair at concentrations up to 23 parts per million, "surprisingly high but probably not dangerous."

Investigation revealed the women frequently washed their hair in one of two detergents prepared by a single leading manufacturer. A second series of experiments found very high concentrations of the poison, 59 to 74 parts per million, in the two detergents, while other detergents contained only about one to eight parts per million.

The scientists' report in *Nature* (May 24) states that sulfuric acid used in the detergent-making processes was obtained from roasting iron sulfides.

Those sulfides, sometimes called iron pyrites or "fool's gold," naturally occur with traces of arsenic. The manufacturer immediately switched to sulfuric acid prepared from pure sulfur.

Most sulfuric acid used in the United States, where detergent manufacture also involves the acid step, is prepared from pure sulfur virtually free from arsenic.

Science News Letter, June 7, 1958

AERONAUTICS

Portable Control Tower For Air Force Operations

➤ A CAPSULE control tower and communications center drawn by jeeps was demonstrated at Andrews Air Force Base, Washington, D. C.

Dubbed "Project Two-Wheels," the mobile air center is mounted on seven family-style trailers, each with a job to do in setting up rapid aircraft control and navigational assistance.

The separate two-wheeled construction of the components allows the system to operate over rough roads and rugged terrain and to be set up alongside an airstrip or open field in a matter of minutes. When necessary, the equipment can be partially disassembled and loaded aboard aircraft for rapid transport to distant points.

The system includes the various functions necessary to complete air traffic control: radio sets on all frequencies, homing beacons and direction finders, as well as a two-way radio-teletype system and facsimile receiver for relaying weather information. Each trailer contains its own air conditioner and a five-kilowatt diesel power generator.

Any one of the units is designed to operate either by itself or as part of an integrated system, currently undergoing further refinement by the General Engineering Laboratory of the Air Force's Research and Development Command.

Science News Letter, June 7, 1958

ELECTRONICS

Electronic Machine Plays Chess

➤ A CHESS-PLAYING electronic computer that will play better than a fairly good player and another machine that can solve problems in geometry as well as a high school sophomore have been described.

The two computers exist only as instructions, or "programs," for other computers. They could be built as separate, special purpose devices, but scientists see no need to do this since the results are the same using the especially designed programs.

For both the computers, only the rules set up by their designers can now be followed, but both will be expanded later so the machines can learn from experience. The two units were described at a meeting on scientific communications held at the International Business Machines Corporation plant in San Jose, Calif. (See p. 355.)

The chess player was designed by Dr. Allen Newell, psychologist, and Dr. H. A. Simon, social scientist, both of Carnegie Institute of Technology, Pittsburgh. It is expected to play better than Dr. Newell but not as well as Dr. Simon, who is rated quite good. This is the third chess-playing machine to be put on a set of instructions in this country, and by far the best player. The Russians also have a chess player that is believed to be on about the same level but not much is known about it.

The chess player acts like a panel of "experts." It is essentially a collection of "rules of thumb" designed to accomplish certain goals, such as protecting the safety of the chess king, controlling the board's center, or maintaining a balance of pieces.

Each "expert" can propose a move and each can reject a move proposed by another expert. Sometimes moves may be analyzed as many as ten moves ahead. The move that is finally chosen, however, is not necessarily the best possible—it is merely the first move that all "experts" can agree is acceptable.

The chess playing machine usually takes about ten hours before an agreement is reached and the move made. That is too much time for tournament play.

The geometrical theorem machine was described by Dr. Nat Rochester of IBM's research staff. It consists of three parts.

One unit constructs diagrams and looks for the obvious relationships, such as how many triangles it contains, and which angles and lines are equal. In about five seconds, this unit can analyze a diagram from a high school textbook, which is considerably faster than a high school student.

Another section, the syntax part of the machine, then looks up the rules that might be useful in solving the problem. The third part, a supervisory unit, tries these rules one after another until the problem is solved.

As soon as the geometry machine has worked its way through high school geometry, Dr. Rochester intends to change the rules from classic, Euclidean geometry, to non-Euclidean geometry. Then he will ask the machine to change its method of solving problems accordingly. This will be a step in the direction of a true learning machine.

Even with the fantastic speeds of modern computers, no machine can try all the possible moves in a chess game or all possible ways of solving a theorem, or problem, in geometry. No machine has yet beaten a very good chess player or proved a mathematical theorem not previously proved, but designers expect machines will do so in the near future.

Science News Letter, June 7, 1958

TECHNOLOGY

Central School Intercom Lowers Education Costs

➤ A CLASSROOM communications concept that is expected to lower education costs to the taxpayer was revealed in an educational exhibit at the Sheraton-Blackstone Hotel in Chicago.

Named the DuKane Multi-purpose Communication and Signaling System, MCS for short, the device incorporates six school communications installations operated from a central control desk:

1. Fire or emergency alarm system; 2. program clock signals; 3. central sound system, - two-way; 4. automatic telephone service; 5. classroom TV distribution, "off-the-air" or school studio, and 6. school-to-home system for bedridden students.

Schools now often employ as many as three electronic systems, each separately installed. Uneconomical overlaps or functional gaps occur. Where an additional service is required, a separate installation must be made.

Science News Letter, June 7, 1958

IN SCIENC

EDUCATION

Today Bright Child Often From Average Home

➤ SCHOOL CHILDREN are getting brighter and brighter, and more and more gifted children are coming from average homes.

This was found by Dr. Elizabeth M. Drews of Michigan State University in a study of gifted youngsters in the Lansing public schools. In the 1920's, she said, a majority of very bright children were the sons or daughters of professional and high level managerial parents. Today, more and more are coming from the ranks of skilled, semi-skilled and white collar workers.

Schools are better today, Dr. Drews explained, and children are staying in them longer. Newspapers, television, radio, movies, magazines and books also give the children more stimulation in the home. More classical recordings, good art prints and better magazines are being purchased today.

Science News Letter, June 7, 1958

MEDICINE

Snakes Get Radioactive Iodine to Study Venom

➤ COTTONMOUTH moccasions are receiving injections of radioactive iodine in an attempt to discover more about the little-known nature of snake venom.

Iodine, which characteristically travels to the thyroid, also goes to the snake's poison gland. Very little information is available about the function of the poison gland, especially its link with the thyroid gland.

The unknown facts about poisonous venom are how long it takes for the venom to distribute itself through the body; where it goes; and what it does when it gets there.

Dr. Joseph F. Gennaro Jr., assistant professor of anatomy at the University of Florida's College of Medicine, is attempting to find answers to these questions by analyzing the radioactive snake venom milked from the snake after the iodine injection.

Studies so far have shown that the poison gland acts much like a thyroid in that it takes up radioiodine and reacts to thyroid stimulators and inhibitors, Dr. Gennaro said.

Further work is continuing on fractionating the venom into its components, all of which seem to play some part in killing. If the toxic portion is also labeled with radioactive iodine, such labeled components can be injected into test animals to determine the site of its killing action.

Dr. Gennaro has been assisted by Howard Ramsey, a medical student at the University.

Science News Letter, June 7, 1958

NCE FIELDS

ASTRONAUTICS

High Satellites Visible Well Into Full Night

➤ SATELLITES circling the earth at very high altitudes can be seen well into the full night as well as at twilight.

Moonwatch observers should be relieved every 30 minutes, if possible.

These are two conclusions of separate studies on the visibility of satellites reported in *Science* (May 23) by Naval Research Laboratory scientists.

They used a device that simulates the passage of a satellite in both studies. Drs. I. S. Gulledge, M. J. Koomen, D. M. Packer and R. Tousey found that a 20-inch satellite orbiting at 800 miles will be sunlit until the sun is 34 degrees below the horizon.

Thus it can be seen moving against a sky filled with stars well into the full night, especially if it passes somewhat away from the zenith in the direction of the set sun.

Drs. W. D. Garvey, Irene S. Gulledge and Jean B. Henson studied the effect of length of observing time on the chances of detecting a faint satellite.

At a typical Moonwatch station set up to detect earth satellites, each observer looks through a low-power telescope at a part of the sky on a north-south line. He may be required to watch his assigned area for two hours or more.

The latter three scientists found that sometime between 15 and 30 minutes after the start of a watch, there is a decrease in a person's ability to spot a faint satellite, probably associated with decreasing vigilance.

Nevertheless, if there is no one to relieve a Moonwatch observer, "it is worthwhile for an observer to watch continuously for one to two hours," they conclude. This is because the satellite will often be bright enough to be seen in spite of the fact it must be brighter to be spotted late in an observing session than during the first half hour of it.

Science News Letter, June 7, 1958

MEDICINE

Electronic Heart May Replace Defective Organ

➤ ELECTRONIC hearts, kidneys, lungs, limbs and other organs of the human body may some day be as common as false teeth and hearing aids, Brig. Gen. David Sarnoff has predicted.

In addition, the day may come when electronic devices will help the blind to "see," control movements of the artificial limbs, aid scientists in their quest for a cancer cure, and bring the latest medical advice to any part of the world by television.

The probability that a man-made device would ever take over the functions of a bodily organ would have seemed wildly fantastic before the electronic age, Gen. Sarnoff told the World Congress of Gastroenterology meeting in Washington, D. C.

But to a limited extent this goal has already been reached, bringing within the bounds of feasible surgery some operations formerly considered imprudent, if not impossible.

Electronic substitutes may be the ordinary replacement for defective organs in future years. A man may walk around in apparent good health with several of his organs replaced by the refined electronic devices.

Devices that in some measure "see" for the blind are in the experimental stages now. Work has been done to perfect the electronic detection of obstacles in the path of the blind or sudden changes in the ground or pavement levels. Progress is being made in translating ordinary type into audible signals, thus enabling the blind to "read" conventional printed matter.

Gen. Sarnoff is chairman of the Board of the Radio Corporation of America.

Science News Letter, June 7, 1958

MYCOLOGY

Valley Fever Fungus Resists Long, Hot Summer

➤ THE LONG, hot summer apparently cannot completely destroy the soil fungus that causes valley fever or coccidioidomycosis in humans. It has been found to exist throughout the hottest months in isolated small pockets six to eight inches deep in the earth.

This has been indicated in studies of desert field samples by Drs. Orda A. Plunkett and F. E. Swatek, mycologists at the University of California at Los Angeles.

Some time ago an anthropology class from UCLA excavated an old Indian camp site in the desert country near Inyokern, Calif. Two weeks later four members of the class and a fifth student, who had cleaned relics collected at the site, developed primary coccidioidomycosis which is a fungal lung infection. The students were promptly treated and the infection quickly cleared up.

Drs. Plunkett and Swatek studied soil samples taken from the site for a period of a year. It was found that during the hot desert months of August and November live spores of the soil fungus disappeared from the surface but existed six to eight inches in the soil, where it was somewhat cooler.

There was no evidence of the organism in the area outside of a small pocket six by ten feet, although the fungus is known to be airborne and high winds are frequent in the area.

Repeated sampling of soils from the immediate vicinity have never produced a positive sample.

The investigators said that apparently some unknown factor in the environment favors the growth of this fungus in certain definite habitats.

Science News Letter, June 7, 1958

MEDICINE

Injection Into Brain Aids In Parkinson's Disease

➤ CHEMOPALLIDECTOMY, injection of chemicals into the brain, is bringing help and improvement to sufferers of Parkinson's disease, or shaking palsy.

A follow-up study of 106 patients who had undergone the neurosurgery from six to 28 months before showed that they were, for the most part, in a better position than those who had not had the operation.

Of the group operated on, 89% reported that tremor and rigidity on the side affected by the operation showed improvement. Less than five percent noted any worsening of symptoms, Drs. Manuel Riklan, chief of the psychological and vocational services, St. Barnabas Hospital, New York, and Leonard Diller, coordinator of training and research in psychology, New York University Institute of Physical Medicine and Rehabilitation, report in the *Journal of the American Medical Association* (May 3).

The group operated upon became less dependent on assistance in daily self-care activities. Some were able to take up or resume useful occupations which contributed to a feeling of motivation and self-respect.

The surgery itself consists of injecting alcohol or a similar substance into either the globus pallidus or the ventrolateral nucleus of the thalamus, located in the lower middle section of the brain. This causes a chemical lesion, or wound, which relieves both tremor and rigidity.

The operation was devised in 1953 by Dr. Irving S. Cooper of New York University-Bellevue Medical Center.

Science News Letter, June 7, 1958

TECHNOLOGY

USDA Develops Durable Finish for Wood Houses

➤ A NATURAL finish for wood house siding, described as "the most durable" yet, has been developed by the U. S. Department of Agriculture's Forest Products Laboratory.

Scientists at the Laboratory, located in Madison, Wis., have been studying natural finishes for ten years and have come up with a "modified stain" that lasts four years. Most finishes now being marketed last only a year. It is said to be particularly good for western redcedar, redwood or Philippine mahogany sidings.

Although more tests are planned before the laboratory scientists give the finish an unqualified recommendation, many requests for the formula have been made and the information is available. The stain contains boiled linseed oil, turpentine, color-in-oil, paraffin wax, penta-chlorophenal and zinc stearate.

Its main drawbacks are that it dries slowly, taking one full day of good drying weather, and that, because it contains wax, it is hard to paint over the finish.

Science News Letter, June 7, 1958

METEOROLOGY

Spot Hurricanes From "Moons"

Several satellites equipped with TV-like "eyes" could spot birth of a tropical storm and keep its changing path under constant surveillance, improving predictions of its course.

By ANN EWING

➤ MAN-MADE earth satellites equipped with TV-like "eyes" will soon be aiding weathermen spot and track hurricanes, the giant tropical storms whose yearly season officially started June 1.

From information on the earth's cloud cover relayed by a satellite, weathermen could detect the characteristic cloud formation of a hurricane long before the storm might otherwise be found.

Hurricanes are essentially oceanic. They are bred in tropical regions far removed from the dense network of observing stations on land areas. The easterly wave, or disturbance, in which hurricanes are spawned are often known only because a ship, by chance, happens to sail through the area.

A picture taken from afar covering a broad area of the earth's surface would very likely solve the problem of detecting hurricanes in their early stages.

Ideally, weathermen would like to have enough satellites in space to keep a hurricane under constant surveillance. The moons' electronic eyes would record the vagaries of a storm's motion much sooner and more accurately than possible either by airplanes or radars.

Satellite Patrol

Dr. Harry Wexler, director of the Weather Bureau's Office of Meteorological Research, has long been a strong proponent of using satellites in patroling for severe storms. From a satellite, he told SCIENCE SERVICE, a hurricane would resemble a tiny pinwheel of clouds, with a spiral formation much like that found in the star systems called galaxies.

The first U. S. satellite to carry equipment for reporting earth's cloud formations is scheduled to be launched this year. However, until larger and more complex instruments in several satellites are available, weathermen are relying on tested methods for investigating and tracking tropical storms.

New facts about hurricanes have already been gathered in the Weather Bureau's stepped-up program for severe storm research. If this year's program confirms the recent findings, more accurate predictions of the births, paths and lifetimes of tropical storms will result, even without help from satellites.

Currently, a hurricane's structure can be considered similar to that of a gigantic smokestack, some 30,000 feet tall. Above 10,000 feet, the "smokestack" widens slowly, and there is now evidence the environment between that level and 20,000 feet controls the storm's development. Cold air moving in and mixing with the warm can throttle its growth, and may also account for changes in its direction.

Hurricanes do not have the uniform structure once assumed. Systematic eddies whose cause is not yet known have been found throughout the entire storm. Some of these areas of seemingly ordered wind variations might be identified as false "eyes." Another new finding is that a hurricane apparently knows where it is going.

The organization of winds in the violent core immediately surrounding the center holds the clue to the storm's rate and direction of motion for the following 24 hours. The hurricane's future path can be plotted immediately in a reconnaissance airplane from readings of maximum winds taken in the four directions at equal distances from the storm's center as determined by radar. (See SNL May 17, p. 315.)

Such readings will be taken operationally this summer.

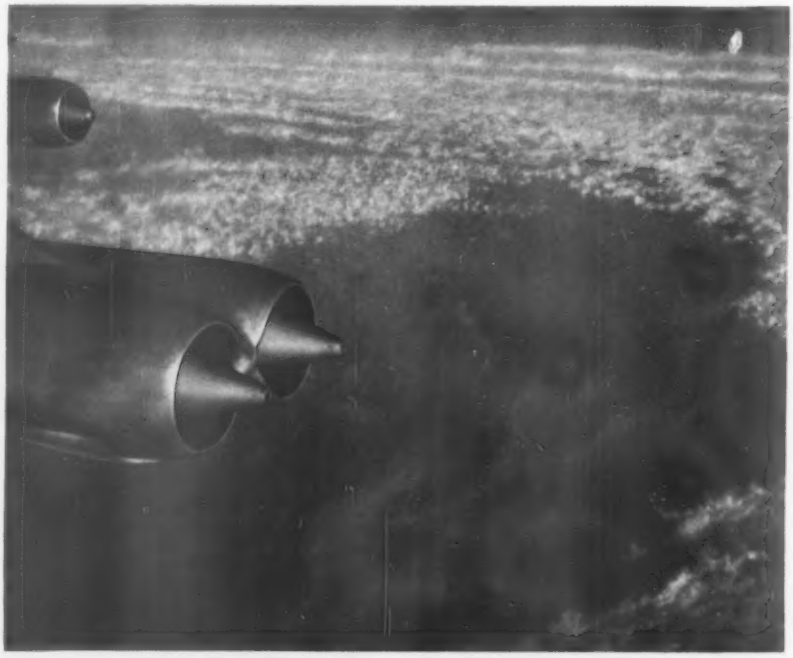
If the Weather Bureau's Hurricane Research Project's third year of investigations, now starting, shows these conditions also hold for 1958 storms, an important step in understanding, and therefore in predicting paths for, hurricanes will have been made.

One definite plan to be tried for the first time in 1958 is to place constant-level balloons equipped with radio transmitters in the storm's calm center. Several will be dropped in each hurricane's eye in order to obtain a constant record of the storm's course.

The balloons will not only aid forecasters in tracking, but will give them information on the forces at the storm's center that could not be obtained in any other way.

Three Hurricane Probes

Three research aircraft, equipped with the latest meteorological instruments, accurate navigation instruments and radar, will fly into the storm simultaneously. With the cooperation of the U. S. Navy and Air Force, the planes will be used to get an overall picture of the storm's structure—temperature, pressure, wind, humidity, cloud composition, etc. They will sweep through all portions of the hurricane along one path at a selected level in order to obtain such information simultaneously. One aim is to find out if or how much the storm changes while its structure is being measured.



"EYE" OF HURRICANE—From a high-flying airplane a hurricane's "eye" and the immediately surrounding cloud structure have been photographed. Careful study of such photographs and other storm conditions is yielding important new information about tropical storms.

Also planned for this summer's research is the launching of Navy rockets from the Wallops Island, Va., facility of the National Advisory Committee for Aeronautics. The idea is to take a picture of the storm's cloud system and its environment, covering a radius of about 1,000 miles, from a height of about 100 miles.

A different method of taking a hurricane's picture is also a Navy project: the hurricoon, a giant Skyhook balloon carrying a camera gondola. It can be sent to roughly the right area and later recovered because of a high altitude wind reversal occurring during summer in the latitude of the United States. The hurricoon will take one picture about every 15 minutes for 12 hours or more.

Cooperating this summer in the Bureau's hurricane research will be meteorologists from the University of Chicago, led by Dr. Herbert Riehl. They have been developing mathematical methods of predicting hurricane paths, some of which require electronic computers for solution.

One experiment the Weather Bureau is "ready and willing" to try, according to its chief, Dr. F. W. Reichelderfer, is to attempt to change a baby hurricane's direction of movement or intensity before it develops into a full-scale storm. Such an attempt would be made, however, only when conditions are right and there is no chance any harm might result.

Science News Letter, June 7, 1958

EVOLUTION

Fossil Skulls of Dog-Like Animal Go to Museum

➤ FOSSIL SKULLS of a dog-like creature that probably is related to the ancestor of today's dogs—an ancestor's ancestor—have been acquired by the Smithsonian Institution.

There is evidence this early "dog" was less intelligent than dogs now are.

The two "excellent" skulls of Daphoenus, an animal about the size of a collie, have both dog- and cat-like characteristics. This reflects the fact that Daphoenus lived some 35,000,000 years ago at a time when the dog and cat lines were less widely separated than today.

All the brain areas, as reconstructed from the skulls, were relatively smaller than those found in modern breeds of dog. This was especially true of the frontal lobes, said to be the seat of animal intelligence.

Daphoenus had a moderately long skull, a short face and a short muzzle which narrowed abruptly in front of the eyes. The smallness of the frontal lobes of the brain presumably accounts for the narrowing of the skull.

Dr. C. L. Gazin, Smithsonian curator of vertebrate paleontology, took the skulls from a fossil bed north of Harrison, Nebr.

Science News Letter, June 7, 1958

ASTRONOMY

Dispute Origin of Tektites

The origin of the mysterious tektites is currently being disputed, with evidence being offered that discredits theories claiming they come from the moon.

➤ THREE SCIENTISTS, one a Nobel Prize winner, disagree strongly with the theory that tektites are lunar particles ejected from the moon by impact of meteorites.

Tektites are glassy objects found in widely scattered groups around the world. Their origin has been a mystery since they were discovered, and many theories concerning their source have been proposed.

Recently Drs. C. M. Varsavsky of the Smithsonian Astrophysical Observatory, J. A. O'Keefe of the Army Map Service and T. Gold of Harvard College Observatory have all argued for the lunar origin of the tektites.

Not so, say Virgil E. Barnes of the University of Texas, Prof. Zdenek Kopal of the University of Manchester, England, and Dr. Harold C. Urey, University of Chicago Nobelist. In three separate reports in *Nature* (May 24) each presents his disproof of the lunar origin.

Mr. Barnes argues that tektites are found in groups, not as randomly arriving objects. Those found in different regions display different characteristics. This separation, both in time and in characteristics, "should be sufficient in itself to discredit" the theory of lunar origin.

Dr. Kopal points out that probably the "most significant fact known about the terrestrial tektites is their clustering in certain localities constituting only a tiny fraction of the total solid surface of the earth. This fact suggests strongly that their origin must be sought much nearer to the terrestrial surface than the moon."

Nobelist Urey, who has suggested tektites may be associated with the impact of material from comets, explains that they have chemical compositions consistent with those of earthly sedimentary rocks. However, Dr. Urey reports it is very unlikely the moon underwent the same processes that produced the terrestrial sediments. Therefore, he argues, it is necessary to assume that igneous processes on the moon produced the very acid tektites. This is also improbable.

"In this case, the chemical processes on the moon have differed from those on the earth, because only rare terrestrial igneous rocks have compositions approaching those of tektites," Dr. Urey concludes.

Science News Letter, June 7, 1958

OPTICAL BARGAINS

See the Stars, Moon, Planets Close Up!

3" REFLECTING TELESCOPE

60 to 160 Power — An Unusual Buy!

Famous Mt. Palomar Type

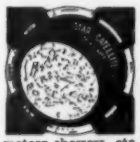
Assembled—ready to use! You'll see the Rings of Saturn, the fascinating planet Mars, huge craters on the Moon, Star Clusters, Moons of Jupiter in detail. Galaxies! Aluminized and overcoated 3" diameter high-speed f/10 mirror. Equatorial mount with lock on both axes. An Optical Finder Telescope, always so essential, is also included. Low cost accessory eyepiece available for power up to 320. Sturdy, hardwood, portable tripod. Free with scope—valuable star chart and 272 page "Astronomy Book." Order by Stock No. Send check or M.O.—Money-back guarantee!

Stock No. 85-050-Q (Shipping wt. 10 lbs.) $29.50 f.o.b. Barrington, N. J.

4¼" ASTRONOMICAL TELESCOPE

Mt. Palomar type. Up to 270 Power. A fine Reflector Telescope complete with real Equatorial Mount and Tripod and 6X Finder. Aluminum tube, 4 ¼" dia. mirror, rack and pinion focusing eye-piece holder, 2 eyepieces and mounted Barlow Lens for 40X, 90X, 120X and 270X. Low cost accessory eye-piece available for power up to 540. Shipping wt. approx. 25 lbs.

Stock No. 85-008-Q, complete, $74.50 f.o.b. Barrington, N. J.



STAR AND SATELLITE PATHFINDER

'Road Map' of the heavens! A rotating chart—shows well over 500 stars in relationship to each other at any selected day and hour. Table on reverse side supplies valuable information on constellations, planets, meteor showers, etc. Included free with order—STAR-PATHS Instruction Booklet . . . shows how to use "Star and Satellite Pathfinder"—contains simplified drawings of celestial sphere, key points of meridian, time correction tables, other valuable data.

Stock No. 9227-Q . . . . . 50¢ Postpaid

(Special quantity prices for fund-raising groups)

AMERICA NEEDS SCIENTISTS!

Stimulate Boys' interest — request our FREE CATALOG-Q featuring hundreds of scientific and astronomical items. No better time than in this INTERNATIONAL GEOPHYSICAL YEAR!

BUILD A SOLAR ENERGY FURNACE

Great Project for Geophysical Year!

A fascinating new field. You can build your own Solar Furnace for experimentation — many practical uses. It's easy—inexpensive, use your scrap wood. We furnish instruction booklet. This sun powered furnace will generate terrific heat—2000° to 3000°. Fuses Enamel to metal. Produces many unusual fusing effects. Sets paper aflame in seconds. Use our Fresnel Lens—14 ¾" diameter . . f/1. 14".

Stock No. 70,130-Q, package of 1 . . . $6.00 Postpaid

ONLY $4.50 ppd.

New! 2 in 1 Combination Pocket-Size

50 POWER MICROSCOPE and 10 POWER TELESCOPE

Useful Telescope and Microscope combined in one amazing, precision instrument. Imported! No larger than a fountain pen. Telescope is 10 Power. Microscope magnifies 50 Times. Sharp focus at any range. Handy for sports, looking at small objects, just plain snooping.

Send Check or M.O. Satisfaction Guaranteed

Order Stock No. 30,059-Q $4.50

FREE CATALOG-Q

Yours for the Asking

America's No. 1 source of supply for experimenters, hobbyists. Complete line of Astronomical Telescope parts and assembled Telescopes. Also huge selection of lenses, prisms, war surplus optical instruments, parts and accessories. Telescopes, microscopes, satellite scopes, binoculars, infrared snipersccopes, items for making "Science Fair" projects, etc. Request Catalog-Q.

Order by Stock No. — Send Check Satisfaction Guaranteed

EDMUND SCIENTIFIC CO.

BARRINGTON, NEW JERSEY

SAFE, ACCURATE, EDUCATIONAL

RADIATION DETECTION KIT YOU ASSEMBLE YOURSELF!

This functioning Geiger Counter kit works on exactly the same principle as an instrument costing $1,000. Precision electronic components are easily assembled without the use of special tools or solder. Operates on only two flashlight batteries. Comes with 48-page manual on "Experiments with Radioactivity," and with all accessories needed.

Complete Library of Science Radiation Detection Kit ready for assembly

ONLY $14.95 POSTPAID

48 FASCINATING EXPERIMENTS IN RADIOACTIVITY

- Making an Electroscope
- Using Radioisotopes
- Detecting Radioactivity
- Making a Radio-autograph
- Comparing Intensities
- Detecting Valuable Ores
- Determining Half-Life
- Detecting Atom Bomb Tests
- Experimenting With Seeds
- Radiation Geometry

SATELLITE PATHFINDER

TRACKS ALL MAN-MADE MOONS!

Complete Library of Science Satellite Pathfinder, ready for use in permanent holder

Precision-made celestial computer accurately pinpoints the position of earth satellites as they pass over the Northern Hemisphere. Just feed simple data for each satellite into the computer, which quickly shows you exact time and positions of satellite's next crossing. Ideal for beginner or professional. Complete, easy-to-understand instructions by K. L. Franklin, Hayden Planetarium astronomer.

ONLY $1.95 POSTPAID

HOW TO ORDER. Use the coupon below to order, or write The Library of Science for further information. Send check, money order; no C.O.D.

The Library of Science 59 Fourth Ave., New York 3, N.Y.

The Library of Science, Dept. 103
59 Fourth Ave., New York 3, N.Y.

Please send me postpaid the following, for which I enclose $..... as payment in full.

☐ Satellite Pathfinder @ $1.95 ☐ Radiation Detection Kit @ $14.95

Name.....

Address.....

City.....Zone....State.....

• Books of the Week •

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

THE ADVENTURE BOOK OF STARS—Thomas D. Nicholson—*Capitol Pub. Co. (Simon & Schuster)*, 111 p., illus., paper, $2.95. With this book for junior star watchers, comes a kit including sighting instrument, star finder, sky map and log sheet.

BEHIND THE SPUTNIKS: A Survey of Soviet Space Science—F. J. Krieger—*Public Affairs Press*, 380 p., illus., $6. Report of a Rand Corporation research study.

THE COMPUTER AND THE BRAIN—John von Neumann—*Yale Univ. Press*, 84 p., $3. An unfinished manuscript that was the last writing of this famous mathematician. It was intended for delivery as the Silliman Lectures at Yale.

CURRENT TRENDS IN THE DESCRIPTION AND ANALYSIS OF BEHAVIOR—Robert Glaser and others—*Univ. of Pittsburgh Press*, 242 p., illus., $4. Nine lectures under the auspices of the Department of Psychology in the College of the University of Pittsburgh.

DESCRIPTION AND USE OF A SATELLITE APPARENT POSITION CALCULATOR—P. G. Kirmser and I. Wakabayashi—*Kansas State College*, Engineering Experiment Station Bulletin 86, 23 p., illus., paper, $1. Contains apparent position calculator chart with plastic overlays.

DIRECTORY OF GRADUATE RESEARCH—Committee on Professional Training, American Chemical Society—*Am. Chemical Soc.* 626 p., paper, $3.50. Listing the faculties, publications and doctoral theses in departments or divisions of chemistry, biochemistry and chemical engineering at U. S. universities.

THE DISPOSAL OF RADIOACTIVE WASTE ON LAND—Committee on Waste Disposal, Division of Earth Sciences—*National Academy of Sciences—National Research Council*, Publication 519, 142 p., paper, $1. Disposal in cavities mined in salt beds and salt domes is suggested as the possibility promising the most practical solution of the problem.

DYNAMIC ANATOMY AND PHYSIOLOGY—L. L. Langley, E. Cheraskin and Ruth Sleeper—*McGraw-Hill*, 719 p., illus., $6. A text with the emphasis on function.

THE FIELD THEORY OF MEANING—Andrew Paul Ushenko, preface by Stephen C. Pepper—*Univ. of Mich. Press*, 182 p., $4.75. On the analogy of dynamic field structures in physics, the author analyzes the contextual field structure of informative meaning.

GOING UP: Voluntary Support of America's Colleges and Universities 1956-57—*Council for Financial Aid to Education*, 48 p., illus., paper, $1.50. Survey of the volume, sources, and purposes of gifts and grants.

THE GOLDEN BOOK OF ANIMALS—Photographs by W. Suschitzky—*Simon and Schuster*, 96 p., illus. with photographs of exceptional beauty, $2.95. A picture book of animals.

THE GOLDEN BOOK OF NATURE CRAFTS: Hobbies and Activities for Boys and Girls—John R. Saunders—*Simon and Schuster*, 68 p., illus. with photographs by Roy Pinney and drawings by Rene Martin, $1.95. A wealth of information and inspiration to help boys and girls embark on hobbies.

THE GREAT DOCTORS: A Biographical History of Medicine—Henry E. Sigerist, translated by Eden and Cedar Paul—*Doubleday*, 422 p., paper, $1.25. Brief biographies of medical greats from Imhotep and Aesculapius to Osler.

THE GYROSCOPE: Theory and Applications—James B. Scarborough—*Interscience*, 257 p., illus., $6.50. Including an exposition of the vector analysis needed to understand the text.

A HISTORY OF PUBLIC HEALTH—George Rosen, foreward by Felix Marti-Ibanez—*MD Publications*, 551 p., $5.75. Recounting man's measures against disease from the time before the Middle Ages when society's protection was to isolate or destroy the patient to the modern era of preventive medicine.

INSOMNIA AND ITS RELATION TO DREAMS—Leonard Gilman—*Lippincott*, 237 p., $4.95. An explanation for the general reader of sleep and lack of it, dreams and the unconscious.

INTRODUCTORY PLANT SCIENCE—Henry T. Northen—*Ronald*, 2d ed., 718 p., illus., $6.75. A beginning text.

THE LAST CONTINENT—Douglas Liversidge—*Jarrolds, (British Bk Centre)*, 248 p., illus., $5. Antarctica has lain in its icy tomb for a hundred million years at least, although the existence of coal indicates an earlier period of perhaps even sub-tropical warmth.

LISTENING IN THE DARK: The Acoustic Orientation of Bats and Men—Donald R. Griffin—*Yale Univ. Press*, 413 p., illus., $7.50. Reporting a study of the way bats navigate by emitting ultrasonic sounds and being guided by their echoes, and the practical use we make of the same principle.

MAN AND HIS PHYSICAL UNIVERSE—Frank Covert Jean and others—*Ginn*, 3d ed., 657 p., illus., $6.50. A text in "generalized science."

MINERALS YEARBOOK 1954: Volume II, Fuels—Staff, U. S. Bureau of Mines—*Govt. Printing Office*, 465 p., illus., $2.25. The three volumes of this yearbook contain all data collected in cooperation with the U. S. Bureau of the Census for the 1954 Census of Mineral Industries.

PATH OF FLIGHT: Practical Information About Navigation of Private Aircraft—Civil Aeronautics Administration—*Govt. Printing Office*, 35 p., illus., paper, 65¢. Providing study material for applicants for private pilot certificates.

THE ROLE OF DIETARY FAT IN HUMAN HEALTH: A Report of the Food and Nutrition Board—Willis A. Gortner, Ed.—*National Academy of Sciences-National Research Council*, 32 p., paper, $1. Fat in the food brought into household kitchens makes up an increasing proportion of the calories.

SCIENTISTS' CHOICE: A Portfolio of Photographs in Science—Franklyn M. Branley, Ed.—*Basic Bks.*, 12 photographs suitable for framing, paper, $4.95. Chosen and described by leading scientists. Includes a booklet on "Using Your Camera in Science," by Jerry A. Schur.

SKIN GRAFTING—James Barrett Brown and Frank McDowell—*Lippincott*, 3d ed., 411 p., illus., $15. Includes chapters on the injuries resulting from farm, industrial and traffic accidents.

SOVIET PHARMACEUTICAL RESEARCH: Volume I, Pharmaceutical Chemistry—*Consultants Bureau*, In English Translation, 447 p., illus., paper, this volume $95, three volumes $200.

SOVIET PHARMACEUTICAL RESEARCH: Volume II, Pharmacognosy—*Consultants Bureau*, In English translation, 401 p., illus., paper, this volume $90, three volumes, $200.

SOVIET PHARMACEUTICAL RESEARCH: Volume III, Medicinal Chemistry—*Consultants Bureau*, In English translation, 556 p., paper, this volume $100, three volumes, $200.

SYMPOSIUM ON NONDESTRUCTIVE TESTS IN THE FIELD OF NUCLEAR ENERGY—Sponsored by the American Institute of Chemical Engineers—*Am. Soc. for Testing Materials*, 395 p., illus., $10.

TOYS, THE TOOLS OF CHILDREN—June Frantz-

en—*National Society for Crippled Children and Adults*, 17 p., illus., paper, $1. A guide for the selection of toys to help in the development of the child.

WILD FOLK IN THE MOUNTAINS—Carroll Lane Fenton—*John Day*, 96 p., illus. with drawings by the author, $3. A book for children about mountain wildlife.

THE YEAR BOOK OF THE INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS 1958—*International Council of Scientific Unions*, 74 p., paper, 75¢.

Science News Letter, June 7, 1958

BIOLOGY

Carbon Dioxide Changes Undifferentiated Cells

➤ WHEN CARBON dioxide is bubbled into a solution containing undifferentiated cells that have just begun to grow after egg fertilization, the cells become brain cells.

Dr. Reed Flickinger, zoologist at the University of California at Los Angeles, is studying the process by which like embryonic cells suddenly begin to specialize to form specific structures such as brain, muscle, skeleton, and reproductive organs.

Addition of small amounts of carbon dioxide—large amounts kill the cells—to undifferentiated frog embryo cells caused the cells to form nervous tissue the day after fertilization, Dr. Flickinger said. Three or four days later definite brain structures could be identified.

Apparently the carbon dioxide stimulates protein synthesis in the cell by causing release of nucleic acids and storage protein from the yolk granules packed in the cell, the UCLA zoologist said.

All cells have equal potential of becoming brain cells or any kind of cell in the body, he pointed out, because they all carry the same genetic information. But some unknown stimulus makes them specialize. Perhaps the carbon-dioxide-stimulated protein synthesis triggers the cell-differentiating mechanism.

There seems to be a specific order in which specialized tissue is formed. Nervous tissue forms first, followed by muscle cells and reproductive organs.

Science News Letter, June 7, 1958

Questions

ASTRONOMY—What are tektites? p. 363.

ELECTRONICS — How can the moon aid in voice communication by telephone? p. 356.

EVOLUTION—When did the prehistoric animal Daphoenus live? p. 363.

MEDICINE—What is chemopallidectomy? p. 361.

SURGERY — What effect did a parathyroid transplant operation have on the amount of oral calcium required by the patient? p. 357.

Photographs: Cover, Bendix Aviation Corporation; p. 355, Sikorsky Aviation; p. 358, British Information Services; p. 359, Dr. Jean-Pierre Perreneoud; p. 362; U. S. Weather Bureau; p. 368, Eastman Chemical Products, Inc.

For CONVENIENT Reference

—a Permanent Binder for your weekly copies of Science News Letter.

Each issue snaps into the cover with an unbreakable metal strip. Binder opens flat for easy reference to all pages.

Holds full year's issues — 52 copies. Sturdy, washable, buff-colored buckram. $4.00 complete, postpaid. Order now, directly from

SCIENCE NEWS LETTER
1719 N St., N.W., Washington 6, D. C.

Heavy

Liquids are our specialty. For det. sp. gr. of solids by sink or float. Suspensions available up to sp. gr. 7.5. Liquids made to order for differentiating good parts from bad. Write for leaflet HL/SNL.

R. P. Cargille Laboratories, Inc.
117 Liberty St. New York 6, NY.

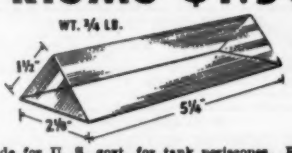
MEMO TO WRITERS:

The priceless ingredient in every book is the integrity of the publisher. If we are convinced of the quality and sales potential of your manuscript, we will offer you a fair cooperative contract. Publication will be handled by men of vision and experience.

Submit your manuscript to:
THE AMERICAN PRESS
Attn: Mr. OHM, 489 Fifth Ave., N.Y., N.Y.

PRISMS $1.50

WT. ¾ LB.



Made for U. S. govt. for tank periscopes. Fine optically ground, big precision prisms with silvered base. Terrific for all types of spectrographic work, in homemade telescopes & other optical systems for bending rays. Makes unusual paper weight (paint your name on it) or conversation piece for mantel. You'll find many other uses. NEW, PERFECT! Cost U. S. govt. $25 ea. NOW—$1.50 ea. ppd. or 4 for $5.00. Same as above—1" long (no silver backing) $1 ea. 5 for $4. Postage paid on prepaid orders. Calif. res. add sales tax.

VOLUME SALES CO.
War Assets Div., Dept. L7
3930 Sunset Blvd. Los Angeles 29, Calif.

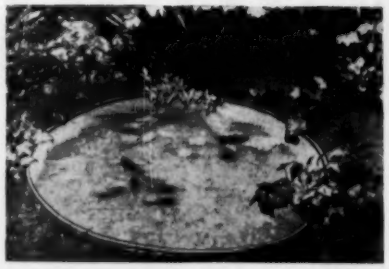
LINGUAPHONE for LANGUAGES

SPANISH (American or European)
FRENCH • GERMAN • RUSSIAN
JAPANESE • MODERN GREEK
—any of 34 languages available AT HOME

LISTEN—LEARN—SPEAK Conversational French, Spanish, Japanese, etc.—or it costs you nothing! You hear 8 to 12 of the world's best NATIVE LANGUAGE TEACHERS on RECORDS. You learn at HOME—easily, quickly by this natural method. 1,000,000 home-study students of all ages.

Send today for FREE Booklet describing the conversational method and details on how you may obtain a COMPLETE Course-unit on FREE TRIAL.

LINGUAPHONE INSTITUTE CI 7-0830
T-31-068 Radio City, New York 20, N. Y.
In Canada: 901 Bleury St., Montreal
Please send me: ☐ FREE BOOK.
☐ Details on FREE Trial. No obligation.
Language Interest .....
Name .....
Address .....
City ..... Zone ..... State .....
World's Standard Conversational Method for Over Half a Century



The Perfect Garden Pond

Here's the ideal garden pond for fish, water lilies, etc. to enhance the beauty of your lawn. Made of rust-proof aluminum frame, clear polyethylene liner with drainage plug. Can be set up in circular, kidney shape or creative designs. Comes complete, easy to assemble. Sizes 4' diameter—$9.95; 5' diameter — $13.95; 8' diameter — $17.95. Price includes shipping and mailing. No C.O.D.'s please Gardenlore, Dept. SN, P. O. Box 21, Langhorne, Pennsylvania.

SPACE AGE MOVIE

EXCITING NEW COLOR FILM OF 1958 WESTERN SPACE AGE CONFERENCE

See the latest Rockets, Guided Missiles (Snark, Regulus, Corporal, Nike, HTV, Hawk — many others) in spectacular color! Free script. Don't miss this important, historical film! 8mm. (50 ft.), only $7.50—16mm (100 ft.), just $17.00. Write Today. Satisfaction Guaranteed!

MAX B. MILLER, Dept. SN
1420 S. Ridgeley Drive, Los Angeles 19, Calif.

COMPREHENSIVE
RELIEF MAP

5 ft. 4 in. x 3 ft. 4 in. 9 colors durable Vinylite

Handsome gift for home or office

A three-dimensional relief map that gives you EVERYTHING . . . not only mountains, lakes and valleys you can see and FEEL, but also 4000 geographical names including over 2000 cities, 600 rivers, 300 national parks and monuments. Extra large, molded in sturdy plastic, lithographed in 9 colors with WASHABLE plastic coating. You can mark map freely with soap crayons and wash off easily with damp cloth. Self-framed in sturdy Vinyl plastic, fitted with grommets for easy hanging. Built to last for years and years, light in weight. Scale 1" equals 50 miles. You must be satisfied or your money returned without question. Freight prepaid anywhere in the U.S.A. Send check or money order. **$45.00**

Same with major highways in red....$47.50

Write for FREE catalog of many other plastic relief maps made by Aero Service Corp., worldwide aerial mapping company.

PANDA PRODUCTS
1200 Niagara R109 Buffalo 13, New York

Special Buy!

ATTACHE CASE

Better Than LEATHER

- Waterproof
- Scuffproof
- Brass plated fittings
- Hardwood frame construction
- Fully Lined
- 17 x 11¾ x 4 inches
- Smart & Practical
- Ginger Tan

Styled by Executives for the carrying of papers, documents and small articles. Appreciated by Students, Salesmen, Accountants, trip takers. Roomy and durable. Practical and Neat.

EXTRA VALUE: with inside file $5.95 plus 10% F.T.

only $4.95 plus 10% Fed. Tax

When remitting please add 75¢ for postage & handling

JOHN SURREY, LTD., 11 W. 32nd St., Dept. SN-58, New York 1, N. Y.

Buy ALL Your Books

This Convenient Way!

Science Service will fill your order for any U. S. book, in print, at regular retail prices. Postage prepaid.

Send orders and remittances to

Book Department

SCIENCE SERVICE
1719 N Street, N.W.
Washington 6, D. C.

ATOMOTRON

- MINIATURE ATOM SMASHER
- PRODUCES 75,000 VOLTS
- ABSOLUTELY SAFE

In no sense of the word a toy or a gadget. The ATOMOTRON is a scientific instrument capable of producing 75,000 volts—makes sparks up to 2" long—yet is absolutely safe because the current is infinitesimal. The science teacher—science lover—or hobbyist can perform experiments to astound students—friends—family. Makes smoke disappear—defy gravity—turns propellers at a distance—transforms atomic energy into light—makes artificial lightning—smashes atoms—demonstrates ionic space ship drive—and many other experiments. Constructed of the finest materials. Will do exactly—for instruction purposes—what generators that cost 3 to 10 times more will do. The perfect device to teach the secrets of atomic physics and electricity. Will hold an audience spellbound as it performs trick after amazing trick. Includes an experiment kit and illustrated experiment manual. Manual explains the "how" and "why." You will invent many new experiments of your own. A fine research tool that will give years of beneficial service to the institution or individual who owns one. In kit form or assembled.

Kit form $14.95

Assembled $19.95

MAIL THIS COUPON

(Please be sure to include your name & address)
OLIVER GARFIELD CO., Dept. SL-58-A
108 E. 16th St., New York 3, N. Y.

Please send me:

1 ATOMOTRON Atom Smasher and Manual.

$19.95 (Complete assembled) .....
$14.95 (In kit form) .....

Add 80¢ for postage and handling in U. S.; $1.00 abroad.

MICRO-ADS

Equipment, supplies and services of special interest to scientists, science teachers and students, science-minded laymen and hobbyists.
25¢ per word, payable in advance. Closing date 3 weeks prior to publication (Saturday).

SNL, 1719 N St., N.W., Washington 6, D. C.

PLASTICS

NEW LIQUID CASTING PLASTIC, CLEAR, colors. Embed real flowers, minerals, biological specimens, delicate instruments, electronic parts. Also cold setting resin and fiberglass for laminating, casting, molding, coating. Manual 25¢. Castolite Co., Dept. G-131. Woodstock, Illinois.

BOOKS AND MAGAZINES

CUT GEMS, MAKE JEWELRY—FOR PROFIT or fun. 100 page magazine tells how; where to get supplies. Sample 25¢ or request free literature. Lapidary Journal, Del Mar 1, Calif.

MISCELLANEOUS

BINDERS FOR SNL—BUFF-COLORED BUCKram Snap-in metal strips holds 52 copies. $4.00 pp. Send order with remittance to Science News Letter, 1719 N Street, N.W., Washington 6, D. C.

PUBLIC HEALTH

Russia Asks War On Smallpox

➤ RUSSIA WANTS the World Health Organization to undertake a crash program to eradicate smallpox in the world.

Russian delegates proposed their smallpox eradication program to WHO's governing body, the World Health Assembly, which opened its first meeting in the United States in Minneapolis, Minn., on May 26.

The Russians also proposed WHO undertake a five-to-seven-year program "of concrete measures in the field of peaceful uses of atomic energy in medicine; a program of assistance to under-developed countries in the uses of radioisotopes in medicine; and the convening of an expert committee to study the effects of radiation on human heredity."

The Soviet smallpox eradication proposal, according to American observers, stems from two factors: the success the Russians have had in ridding their own country of smallpox and a concurrent desire to stave off reinfection; and the expense of both the eradication and possible future action if reinfected.

The Russians, these same observers explain, have become quite practical and business-minded about health and medicine. Their desire for worldwide eradication of smallpox is a result of their own experience and their own costs.

It is also understood that the Russians have been instrumental in getting Red China to initiate a smallpox eradication program.

The Russian proposal calls attention to the economics of smallpox. It points out that the cost of smallpox due to lost labor, deaths and control measures is equal to what it would cost the world to eradicate the disease.

Russia lists 17 countries in which the eradication program should be carried out. Neither Russia itself, nor the United States is on the list.

The Russian timetable, being submitted to the Assembly, calls for preparatory work and a search for the means of eradication to take place this year under the auspices of WHO. Between 1958 and 1960 sufficient vaccine should be produced and vaccinators trained. During 1959 and 1960, the Russians recommend, populations in the 17 countries should be vaccinated.

The Russian eradication program, if adopted, will not affect the Americas greatly, thanks to a program initiated by the Pan American Sanitary Bureau, which also serves as the regional organization of WHO for the Americas.

In 1950, a smallpox eradication program, similar to that being now proposed by the Russians, was set in motion by the Pan American Sanitary Bureau. This program, operating on a low budget and not as a crash program, has paid off handsomely.

There has not been a case of smallpox reported in North America, Central America or the Caribbean since 1954. Only five South American countries still have an appreciable amount of the disease and are busy working on the problem.

Science News Letter, June 7, 1958

Do You Know?

Today, one out of every three persons *employed* is a woman.

Zein is a protein obtained commercially by extraction from corn gluten.

By 1956, 94% of U. S. farm houses had *electricity*.

One-half cup of raw or cooked *carrots* supplies more than the daily requirement of vitamin A.

More than half the *automobiles* on the road have automatic transmissions and by 1965 this proportion may rise to 80%.

Estimates of astronomers have been that one titanic explosion such as a *supernova* can be expected in each galaxy once in several centuries.

Special Tool Bargains-Save Up to 50%

AMAZING BLOCK & TACKLE

- PORTABLE . . . weighs only 13 ozs., fits in pocket!
- ONE HAND OPERATION . . .
- POWERFUL . . . lifts up to 1000 lbs.!

Amazing Work Saver for

- Hunters
- Farmers
- Yachtsmen
- Handymen
- Truck drivers
- Motorists

Here's an unusual tool, even for us! It's the tiny Midget Babe Block and Tackle. It weighs only 13 oz., yet is so powerful it lifts up to 1000 lbs. easily! Because of its great strength, small size, complete portability—this block and tackle has many uses. In your car for emergencies, for home, factory, farm . . . for loading heavy articles. For sportsmen: loading deer, boats, etc. For anyone who has to do heavy lifting! Fine engineered throughout, best grade aluminum, steel axles, pre-lubricated for life. Hoists have two lifting slings, at top and bottom, with heavy welded steel rings. Slings can be doubled for extra strength. Complete with 70 ft. nylon cord, 5 to 1 ratio—1000 lb. test. Carrying bag. Instructions. ppd. **$9.95**

ALSO AVAILABLE—Tiny Babe—Lifts up to 2000 lbs.! With 100 ft. nylon cord, 7-1 ratio—2000 lb. test—15 oz. wgt. Twice as powerful as $9.95 model—only $12.95 ppd.

1 yr. guarantee on both models.

DUREX HOLE SAW

with Exclusive New Automatic SLUG EJECTOR

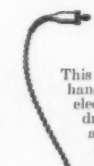
7 Hole Saws in One

Fits any electric drill, drill press, lathe, motor. Automatic slug ejector pops out slug immediately. This saw works three times as fast as other hole saws that sell for twice as much! Cuts 1", 1¼", 1½", 1¾", 2", 2¼" and 2½" holes cleanly, accurately. Cuts wood, plastic, metals, formica, wall board, etc. Consists of sturdy alloy tool head, 7 finest quality shatterproof blades, automatic slug ejector and ⅛" drill bit.

only **$4.95** plus 35¢ pp. & hdlg.

36" FLEXIBLE SHAFT

For Precision Working —Hard to Get At Places!



Reg. $9.95 **Now $4.95**

plus 35¢ pp. & hdlg.

This handy flexible shaft with complete handle increases the utility of your electric drill, electric motor, grinder or drill press where ¼" shank can be attached. Easily attached to do grinding, carving, drilling, sanding, polishing, buffing, slotting, engraving, etching, etc., on wood, metal, glass and plastic. The flexible shaft is tamper-proof, sealed and designed for lifetime service. Can be operated at speeds up to 6000 RPM.

PRECISION MICROMETERS

At Bargain Prices!

Chrome plated, adjustable, equipped with ratchet stop and lock nut. Adjustable for zero. Decimal equivalents of fractional sizes diesunk on frame. Recessed frame to allow readings in tight spots. Precision made for accurate readings, fully polished. In velvet lined case.

0-1", 1/1,000" Readings **$5.95** ppd.

1-2", 1/1,000" Readings with 1" test gauge **$7.95** ppd.

20 CAMEL HAIR Quality BRUSHES

Close-Out— Only 5¢ each

Precision crafted in West Germany. Perfect for artists, touching up around house, cleaning electrical and optical instruments and guns. Sizes range from fine #1 to full #5. Select camel hair firmly set in metal grip to give years of use. Worth many dollars, but ALL 20 yours for only ---------- **$1.00** ppd.

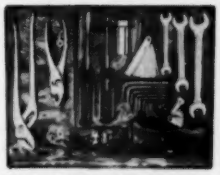
36 Piece Outboard Motor Kit

CHALLENGER

Complete Only

$9.98

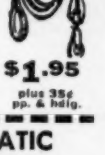
INCLUDES:



- ⅝ x 7/16 Open End Wrench
- ½ x 9/16 Open End Wrench
- ¾ x ¾ Open End Wrench
- 8" Phillips Screwdriver
- 8" Mechanics Screwdriver
- 10" All-Purpose Locking Plier
- 6" Mechanics Plier
- 2 Ignition Files
- 7 Piece Spark Adjustment Tool
- 10 Piece Feeler Gauge
- 7 Piece Set Screw Wrench Set and Kit
- Spark plug holding Socket with Neoprene Insert
- Shear Pin and Cotter Pin Pouch

Also get FREE Waterproof "Roll-up" Kit and Popular Mechanics "OUTBOARD MOTOR MANUAL". Hundreds of facts and expert advice. Be ready for any emergency that requires tools. The Challenger 36 Piece Kit contains just everything you'll need . . . AND . . . each tool is precision made for sure performance when repairs are needed. The Maintenance Kit is water-proof and folds down to just 9" x 11½" x 2". Order yours. It's like money in the bank when you need tools. Only $9.98 complete plus 50¢ for postage and handling. Send today on our 10 Day Money Back Guarantee.

Gov't Surplus WEBBED TOW CABLE



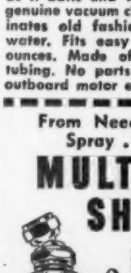
Originally made for U.S. Air Force. Never used. Test proven for towing trucks, cars, etc. 15 ft. long with extra heavy duty spring snap cable ⅝" wide. Nylon reinforced cable is ¼" thick and 1¼" wide at ends. Useful at home or keep in car for emergencies. **$1.95** plus 35¢ pp. & hdlg.

Vacu Jet AUTOMATIC BOAT BAILER $3.95 ppd.

Draws out 3 to 5 gallons of water a minute. Sucks out the last drop. Will not scratch or injure motor. Simple installation. No tools required. Fits any size motor. Hooks on to the motor in a jiffy, and when motor is started suction through the top draws water from the boat. It cleans as it bails and works like a genuine vacuum cleaner. Eliminates old fashioned hand method of bailing water. Fits easy in a tackle box. Weighs 10 ounces. Made of the finest plastic and vinyl tubing. No parts to wear or corrode. Fits any outboard motor except 3 h.p.

From Needle Shower to Heavy Spray . . . in an Instant!

MULTI-STREAM SHOWER HEAD

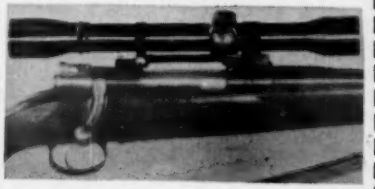


Just a flip of the lever and you can adjust the Multi-Stream Head from an invigorating, fine needle-sharp spray to a heavy, drenching spray of water . . . and anything in between! Don't mess or fuss with hot and cold faucets with the chance of scalding or freezing—set the water temperature desired just once and use the Multi-Stream Head for all other adjustments! Made of heavy chrome plate on brass. The hand adjustable swivel ball head permits spray in any direction! Five adjustable cylinder outlets easily slide back and forth, controlled by a single, handy lever. A $9.95 value . . . OUR PRICE $4.95 ppd. GUARANTEED.

Set of 10

MAGIC MAGNETS

These powerful permanently magnetized magnets—each the size of a jelly bean—lifts over ½ pound! Sewn into your holders, towels or shower curtains—makes them securely cling to steel. Holds items on dashboard, metal files, demonstration or bulletin boards. Recover items from hard-to-get-at places. Pulls through glass, wood, paper, leather, plastic—anything but iron. All 10 rustproof magnets— **$1.00** ppd.



APACHE RIFLE SCOPES

Insure Sharper Shooting

APACHE rifle scopes 4X and 6X are the finest for .22 calibre rimfire rifles. Complete with mount that fits all dovetail groove receivers, plus many features usually found only in more expensive scopes. Click adjustments, weather caps, and the best in optics.

1. Protective cap on adjusting knob.
2. Knurled edge for finger adjustment. No coin or screwdriver necessary.
3. Better constructed prism box—larger, too!
4. Balanced tip-off mounts.
5. Better ground optical lenses for greater light gathering.
6. Will fit any .22 calibre rifle with groove receiver.
7. Mounts are included in price.
8. Manufactured by makers of TEXAN scopes.
9. Unconditionally guaranteed.
10. Split second adjustment.
11. FREE—calibrated target for zeroing-in scope.

4X—$10.95 postpaid

6X—$12.95 postpaid

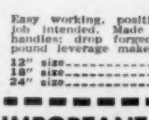
Fully Guaranteed—Order Today

FINEST QUALITY Imported Precision Pliers 75¢ Ea.

Flat Nose, Round Nose, Diagonal, End Cutting Nippers, 1 Side Flat—1 Side Round, Snipe Combination for Jewelers, Optical Workers, Hobbyists. These European instruments are of deep-forged, heat-treated high quality tool steel, fabricated to most exacting specifications. All-over ground, polished to smooth hard surfaces. Smooth working joints with right tension. Jaws meet perfectly to securely hold the most delicate objects in hard-to-reach corners and angles. Each plier is 4" long.

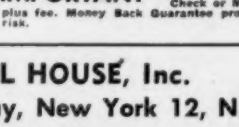
75¢ EACH, ALL 7 FOR $5.00 ppd.

Lifetime Grit HANDY SANDER



Tungsten Carbide Grit Brazed on Steel

New lifetime abrasive miracle tungsten carbide grits brazed on steel gives a diamond-like cutting hardness. Perfectly finishes wood, plaster, plastic or composition materials. Ideal for dry wall joints, all types of wallboard. Never needs replacing—always stays sharp! Sands twice as fast as sandpaper—does not tear like sandpaper! Easily cleaned. Complete kit includes easy-hold birch sanding block, one coarse grit shoe and one fine grit shoe. Lifetime guaranteed. **$2.00** plus 20¢ pp. & hdlg.



BOLT CUTTERS

Easy working, positive action cutters to do the job intended. Made with black cast alloy steel handles; drop forged exchangeable cutters. Compound leverage makes a difficult job easy.

12" size---------- $3.95 plus 25¢ pp. & hdlg.

18" size---------- $5.75 plus 25¢ pp. & hdlg.

24" size---------- $8.95 plus 35¢ pp. & hdlg.

IMPORTANT Order Today and Save. Minimum order $1.00. Send Check or M.O. C.O.D. orders plus fee. Money Back Guarantee protects you against risk.

SCOTT-MITCHELL HOUSE, Inc.

Dept. 2406—611 Broadway, New York 12, N. Y.

New Machines and Gadgets

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 938. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

EXTENSION CORD HOLDER leaves both ends of the cord accessible. The holder, that promises to eliminate twists and tangles and save cord from wear and tear, can hold different lengths of different diameter cord. As much or as little of the cord as needed can be used without losing control.

Science News Letter, June 7, 1958

LABORATORY MARKING PEN writes on glass, metal, porcelain, plastic, cloth, paper and leather. Ink for the fine-line pen is available in 11 colors and can be removed from slides or instruments with a solvent such as benzol. Yellow and orange inks resist more than 1,500 degrees Fahrenheit temperature.

Science News Letter, June 7, 1958

WORKING PLATFORM can be folded horizontally and wheeled through a 30-inch doorway. The British product is all-aluminum and has rubber casters that can be locked to prevent rolling. The telescopic tower can be assembled in 1½ minutes.

Science News Letter, June 7, 1958

TOY TELEPHONE offers fun for youngsters and a bit of nostalgia for their parents. The toy, shown in the photograph, is a three-quarters actual size model of the

first dial instrument. Molded of a polyethylene plastic, it has an adjustable mouthpiece and a workable dial. A bell rings as the dial is turned.

Science News Letter, June 7, 1958

TRANSISTORIZED TV CAMERA weighs about four pounds, exclusive of the lens, and measures 2⅜ by 5⅜ by 7¾ inches. Separate potted, plug-in modules handle the six basic camera system functions. The tiny TV camera also boasts an automatic electronic light adjustment.

Science News Letter, June 7, 1958

OFFICE COPIER can copy anything from a business card to an outside 10- by 16-inch inventory form. The new copier has an improved paper feed assembly and a new trimmer guide for 10-inch paper. It also houses an automatic timer that compensates for voltage changes.

Science News Letter, June 7, 1958

MINIATURE GREENHOUSES are made of polyethylene plastic film. The gardener's aid consists of a double thickness of the film 12 feet long that is secured to seven metal wickets. The plastic row cover protects plants against wind and frost and encloses warmth and moisture.

Science News Letter, June 7, 1958

KEY-OPERATED WINDOW LOCK is designed for use on all types of double hung wooden sash. It can be used to lock a window that is partially open, too, to permit ventilation. The lock can be installed by the do-it-yourselfer. A paper template and full instructions come with the lock.

Science News Letter, June 7, 1958

Nature Ramblings

By HORACE LOFTIN

"High over the valley, in the cool nights of September
One hears the call notes of migrating Bobolinks
Falling like golden coins gently dropped
On slabs of porphyry.
Clink-clink, Clink-clink . . ."

➤ THIS BIT of blank verse just about describes the unique voice of the bobolink as well as anything can, for the call notes and song of this bird defy imitation. Not even the mocking bird seems to be able to capture the bobolink's music.

After a long winter's absence while they enjoyed the warmth of South America, these flashing birds are coming back to the fields of much of the northern half of the nation and in Canada. Coming up through the West Indies and Central America, the male bobolinks appeared first on the southern coasts in April.

The earliest comers moved rapidly northward to the breeding grounds, where they welcomed the females some time later, as well as tardy males.

The Bobolink

Now, in early June, courtship and breeding are under way, and the song of the bobolink is at its height. In his spring plumage of black with striking white patches on the wings and lower back and with buffy head and neck, the bobolink looks as handsome as he sings.

Towards middle summer, as the young go out on their own, the bobolinks will change the spring cloak for a somber suit, in keeping with their new rather quiet and retiring habits. Then as summer wears on, they begin to assemble in large flocks along the marshes of the Atlantic seaboard.

By September, preparatory to the winter's migration, they have congregated in immense numbers, especially in the rice-growing areas of South Carolina, where—under the name of "rice bird"—they feast heartily.

Years ago, when South Carolina was virtually the sole source of domestic rice, the bobolinks were the greatest menace to the rice crop. During the nesting season, the bobolinks are largely insect-eaters, and so enjoy a reputation of usefulness and beauty in the north.

Where rice and bobolinks are found together, the "rice bird" suffers a different kind of reputation. But, like many lovable rascals, even there his special charm softens many a heart and stays many a trigger finger.

Science News Letter, June 7, 1958